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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,154	10/28/2003	Nansheng Sun	CASE 7039	6444
41669	7590	04/01/2005	EXAMINER	
THE BABCOCK & WILCOX COMPANY PATENT DEPARTMENT 20 SOUTH VAN BUREN AVENUE BARBERTON, OH 44203			WILSON, GREGORY A	
		ART UNIT	PAPER NUMBER	
			3749	

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/695,154	SUN, NANSHENG
	Examiner Gregory A. Wilson	Art Unit 3749

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 18 January 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 14 is/are allowed.
- 6) Claim(s) 1-6 and 9-12 is/are rejected.
- 7) Claim(s) 7,8 and 13 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 2, 5, 6, 11, and 12** are rejected under 35 U.S.C. 102(e) as being anticipated by **Van Swam (6,519,309)**. **Van Swam** discloses a tube support structure in a lattice array (SEE Figure 1) for use within an array of heat exchanger tubes (20), each tube having a diameter and longitudinal axis, the tube structure having a tube support bar (40) for use between a pair of heat exchanger tubes, the support bar comprised of a first metallic strip (42) and a second metallic strip (46). The different materials of the first and second strips are taught in column 3, lines 17-30, wherein it is suggested to use zirconium alloys for the underlying metal of the spacer strips; the one strip material is Zircaloy. Zircaloy and Zirconium alloys are different materials, one having a greater coefficient of thermal expansion over the other. The strips (42, 46) are initially flat (SEE Figure 1) but the Zircaloy will bow at temperatures where zirconium alloys won't. Furthermore, the strips (42) & (46) are attached at spaced intervals being only separate at channels (48).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 3 & 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Swam (6,519,309)**. **Van Swam** discloses the applicants' primary inventive concept as stated above, but does not particularly teach different sizes for the metallic strips. It would have been obvious matter of design choice to modify **Van Swam** by having the metallic strip closest to the heat exchanger tubes have a thinner dimension for bowing purposes than the outer metallic strip, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art.

**Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Swam (6,519,309)**. **Van Swam** discloses the applicant's primary inventive concept, as stated above, but uses Zircaloy and zirconium alloys as the materials for the strips. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use materials made of SB-166 1690 and SA 240 type 410S steels, since it has been held to be within the general skill of a worker in the art to select a known

material on the basis of its suitability for the intended use as a matter of obvious design choice.

**Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Swam (6,519,309)**. **Van Swam** discloses the applicants' primary inventive concept, as stated above, but does not disclose the optimum range in which the tube support structure will be in operation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the tube support structure to withstand temperatures of about 550 degrees F, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

#### ***Allowable Subject Matter***

**Claims 7, 8, and 13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Claim 14** is allowed.

#### ***Response to Arguments***

Applicant's arguments filed 1/18/05 have been fully considered but they are not persuasive. It is noted that the applicants' arguments are primarily focused around statements pertaining to **Van Swam '309** not teaching nor suggesting that the doublet of

strips are made of different materials and not teaching that one strip of the doublet has a coefficient of thermal expansion greater than the other. The examiner hereby respectfully disagrees and maintains that different/separate materials are being taught by Van Swam (6,519,309). Particular attention is directed to column 3, lines 21-30, wherein Zircaloy material is typically used to form at least part of the spacers. Van Swam furthermore teaches that the use of zirconium alloys serve as a sort of reinforcement for the Zircaloy strip. It is also well known in the art that temperature affects growth, wherein the Zircaloy strip would bow where the zirconium alloy taught herein would not. This is considered by the examiner to anticipate the applicants' teaching of the differences in coefficient of thermal expansion.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory A. Wilson whose telephone number is (703) 308-1239. The examiner can normally be reached on 7 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached on (703)308-1935. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**GREGORY WILSON  
PRIMARY EXAMINER**

*Gregory A. Wilson*

Gaw  
March 22, 2005